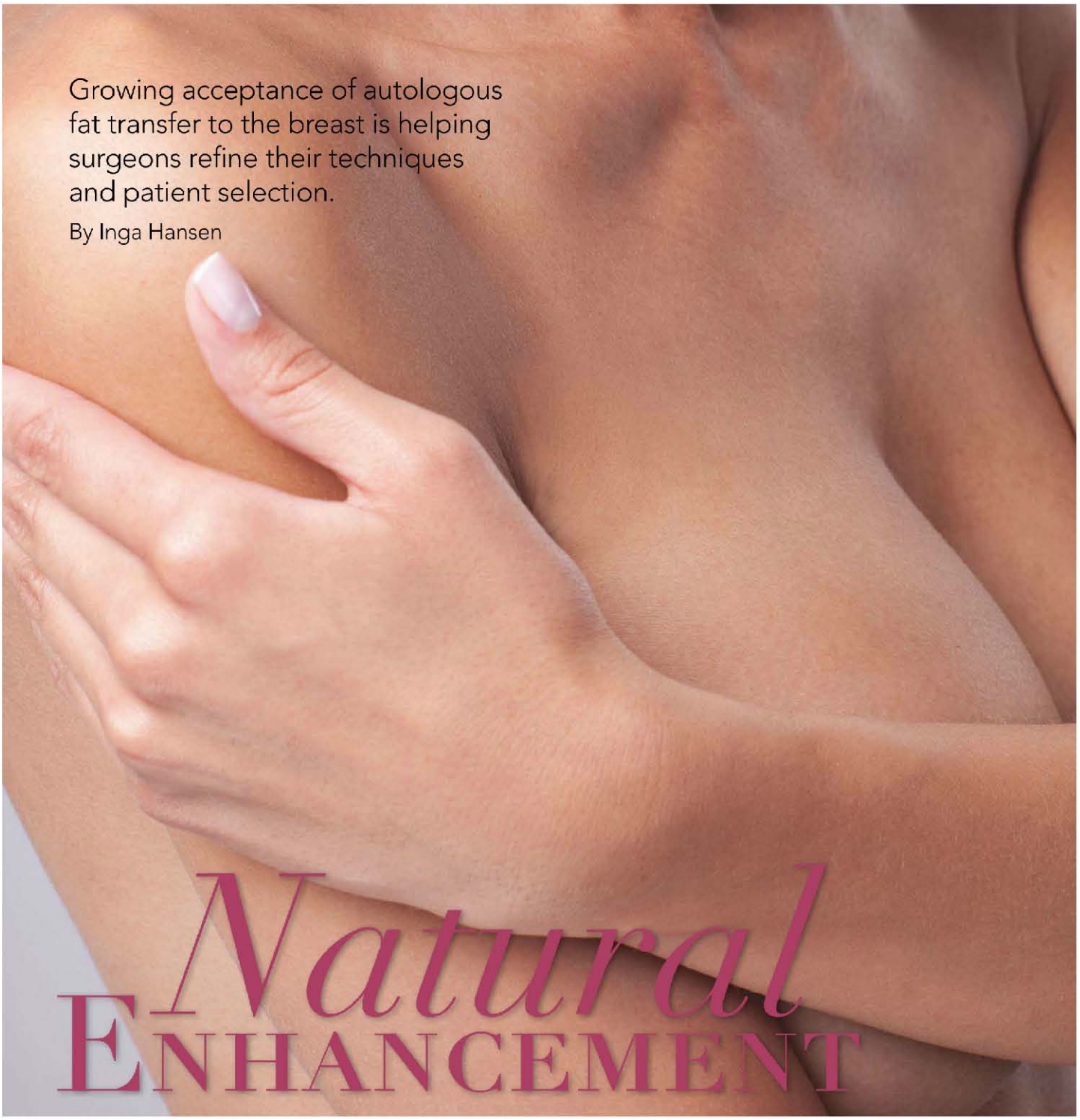


Growing acceptance of autologous fat transfer to the breast is helping surgeons refine their techniques and patient selection.

By Inga Hansen

Natural Enhancement

IN 2009, A TASK FORCE created by the American Society of Plastic Surgeons (ASPS, plasticsurgery.org) announced that fat transfer for breast augmentation "is a promising and clinically relevant research topic." The task force encouraged further studies to determine the safety and efficacy of such procedures as well as the best techniques for fat grafting in this area. Since that time, these procedures have proliferated.

Much of the excitement surrounding breast augmentation with fat transfer is the desire among both patients and doctors to find an alternative to breast implants. But there are several indications for fat grafting to the breast, including primary augmentation, correction of breast deformities, breast reconstruction and implant-to-fat revision surgeries.

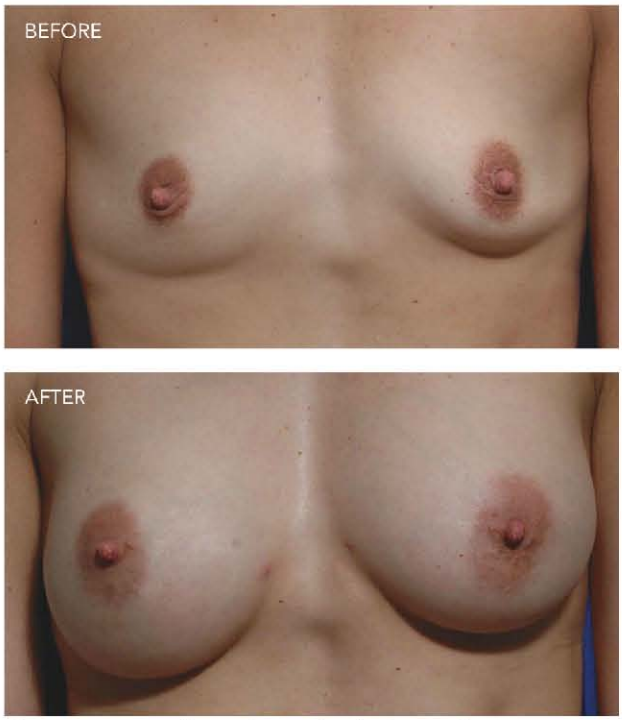
Patient Selection

Patient selection for fat grafting to the breast depends on two main concerns: the desired outcome and the availability of fat. "The biggest impediment is a lot of people who have small breasts but want big breasts don't have a lot of fat, and a lot of them have had liposuction," says Sydney Coleman, MD, a pioneer in fat grafting and founder of Tribeca Plastic Surgery in New York. "This group needs to be approached with caution because it becomes a struggle to get enough fat. The biggest dangers are increased wrinkling of the overlying skin, irregularities that are visible through the skin and laxity of the skin from removing support."

The amount of available fat that can be harvested safely factors heavily into how much augmentation can take place. "For an AA or an A breast, the limitation may be 200cc to 250cc or maybe less. For someone who's already a big B, I can harvest 400cc or maybe even 500cc," says Dr. Coleman.

Kamran Khoobehi, MD, a New Orleans-based plastic surgeon and researcher, notes that the "maximum fat grafting is 700cc for each breast. But the average is about 350cc to 450cc per breast."

A second concern when consulting with slender patients is the size of the breast envelope. Injecting fat into a tight area can reduce the survival rate of the transfer. In these cases, the use of external expanders, such as the BRAVA (mybrava.com) allows for greater volume."It's like planting seeds in a field. If it's a tiny field, you can't plant as many seeds, because they're isn't enough soil for all of them take root," says Roger Khouri, MD, a Miami-based plastic surgeon who specializes in breast reconstruction and is the inventor of the BRAVA. "We use the BRAVA to expand the field—or the envelope—so there is more 'soil' to add the fat."



This patient wanted larger breasts but had minimal soft tissue coverage. Dr. Khoobehi combined implants with fat transfer to create softness and cleavage.

> "Fat transfer gives you a wider breast that doesn't project as much."

Primary Augmentation

In cases where fat is used for primary breast augmentation without an implant, the aesthetic outcome differs in terms of both size and projection. "With fat grafting there is a limitation in how much you can enlarge the breast," says Dr. Khoobehi. "The issue is more quality than quantity. With the implants, you can put [in] any size you want. The limitation is really based on the patient's tissue—how much it can hold and how much the skin can stretch. With fat grafting, the limitation is how much fat the patient has and how much of that fat can be harvested safely."

In addition to a more limited range in overall cup size, Encino, California-based plastic surgeon George H. Sanders, MD, notes that, "Fat transfer will give you a wider breast that doesn't project as much. It's a little bit like sprinkling sand on the floor. You add sand to the pile and add it and add it, by the time you get to the point that the sand pile is very high, it's also very wide. Most of our patients aren't looking for that. They want something narrower that has more projection."

Dr. Khoobehi agrees that not everyone is a good candidate for enlargement with fat grafting,

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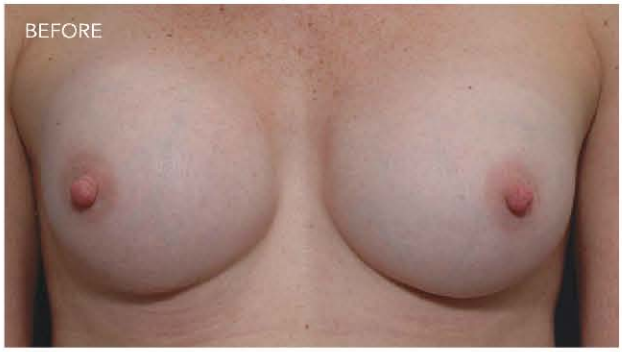
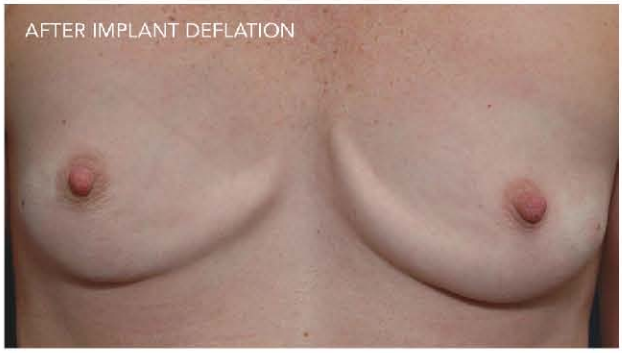
"In general, the patients that I see who are good candidates for primary augmentation are the patients who have very realistic expectations," he says. "They want to go one cup size bigger and, typically, they have had pregnancies and they have lost some volume in the upper poles. They have a little more depression in the upper part of the breast and they want more cleavage. These are the best candidates for primary fat grafting."

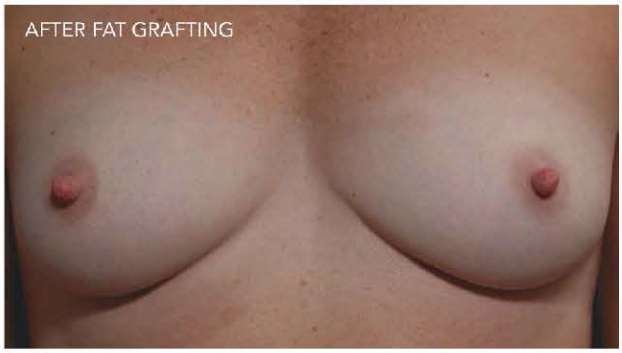
Women with large hips and small breasts are the ideal candidates, says Dr. Khouri, provided they are willing to take the time to achieve a more reasonable enhancement. "About 20% of the fat graft for augmentation patients I see are wives of plastic surgeons or health professionals in the field. Another 40% are working professionals or executives," he says. "These are people who do not want an implant and they know that to get something good, you have to work at it. If you have a patient who wants DDs yesterday, it's much easier to do an implant." Dr. Khouri notes that fat grafting is not a quick fix. "It takes a few months and two to four small outpatient procedures to get there," he says. "I need to take my time and put that fat in one droplet at a time."

Dr. Coleman waits between three and five months between procedures and notes that, in terms of fat survival "what you see at four months is what you will see at a year or at five years.

"The unbelievably wonderful thing about being able to sculpt with fat is that you can put it pretty much any place; whereas with an implant, you can put it in front of the muscle, behind the muscle, you can move it a little bit to the right, to the left or up.







Dr. Khoobehi removed this patient's sub-glandular saline implants and injected fat in both breasts. Results are shown nine months postprocedure.

PHOTOS COURTESY OF KAMRAN KHOOBEHI, MD

External Expanders—Are They For You?

The BRAVA (mybrava.com) external expander was developed by plastic surgeon Roger Khouri, MD, of Miami and has become a valuable tool in fat grafting to the breast. Dr. Coleman calls himself, "a big believer in pre-expansion with BRAVA." He started using the device about five years ago. "You can do successful fat transplantation to the breast without BRAVA, but—especially in people with small envelopes who don't have a lot of breast tissue to inject into—the reverse expansion really facilitates the procedure so you can get a lot more done with the first procedure and each subsequent procedure." He recommends patients wear the BRAVA for three to five weeks before fat injection, but notes that "You have to wear it for at least 10 hours a day. It's really uncomfortable, it leaves you with rashes and it has a little pump that goes all night. Even though I think it has an important role, it is not an easy sell to patients."

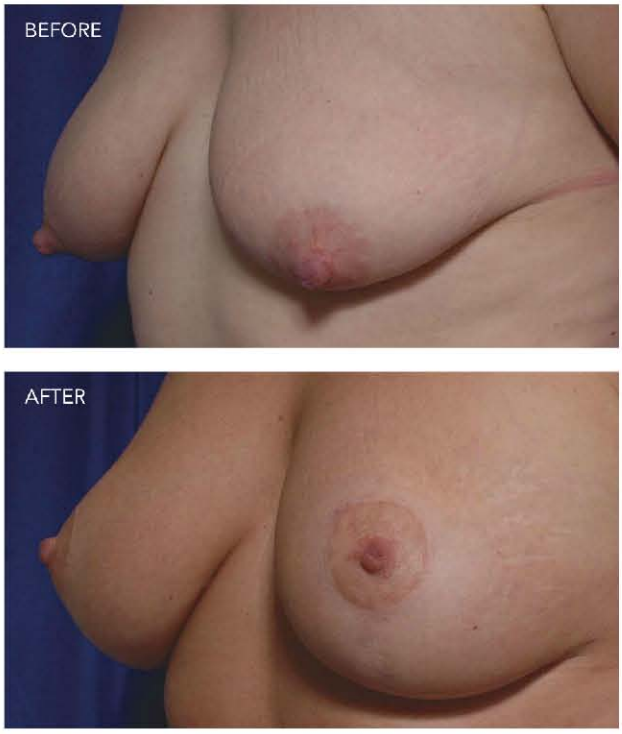
When explaining the need for expansion, Dr. Khouri asks his patients, "Would you rather have a big scar or would you rather do this for a few weeks and have a natural breast?" He recommends patients wear the BRAVA "10 days non-stop—or pretty close—so the breasts are plenty swelled. That is the key," he says.

But you're working with a fixed object," continues Dr. Coleman. "With fat grafting, you can increase cleavage, you can make the upper pole fuller, you can feather the fat into the armpit—which you can't do by any other method—it's an amazing sculpting tool, if you know how to visualize a breast in 3-D."

Breast Reconstruction and Deformities

The ability to take a more nuanced approach to breast augmentation with fat transfer makes it a promising method for reconstruction patients and those who have breast deformities that may not be correctable with implant surgery. "I started with augmentation, but I am much more impressed with what we can do for reconstructions," says Dr. Khouri. "I call it breast regeneration. It feels like a new natural breast. If the patient has one natural breast and one augmented with fat, the two breasts feel the same. There is less surgery, [fewer] potential complications and less recovery time."

For Dr. Coleman, one of the most satisfying indications is tubular breasts. "I think the most fascinating cases are the tuberous breasts in women where their lower pole is constricted to some amount, so that they don't have the normal droop going down," he says. "Another group is women with remarkably assymetric breasts where you can create a great deal of symmetry. The most important thing about fat grafting is the ability to make an abnormally shaped or proportioned breast normal and then take it from normal to especially attractive. We didn't have that before we had fat grafting."



Fat grafting was used to create upper pole fullness and cleavage in conjunction with a bilateral mastoplexy for this patient. Results are one year postsurgery.

> "The most important thing about fat grafting is the ability to make an abnormally shaped or proportioned breast normal."

"Another group of patients are those we might call implant crippled. They've had five or six implant surgeries, and they just don't want implants anymore," says Dr. Khoobehi. "I remove the implant and do fat grafting. This is my biggest group."

Dr. Sanders also sees implant-to-fat revisions as one of the most promising indications for fat transfer, particularly for patients who have experienced multiple capsular contractures with implants. "It's getting to be very expensive, and it's just not working out well. In a case like that the thought would be, would you rather have your implant removed and have fat injection instead?" he says. "And it appears that, in some cases of capsular contracture, if you inject fat around the scar tissue, there can be a softening of the contracture."

Two patient groups that Dr. Khoobehi sees regularly in his practice are masoplexy patients and reconstruction patients. "In the past, the only option for patients who needed a lift was to do the lift and implant together," he says. "I use the fat for upper pole fullness and then I do the lift. For breast cancer patients who have had a mastectomy and reconstruction with different flaps, when they come

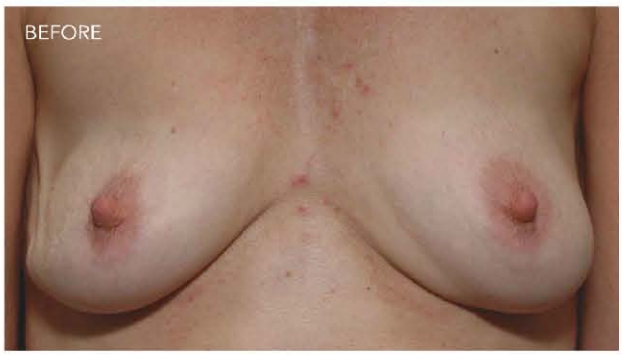
PHOTOS COURTESY OF KAMRAN KHOOBEHI, MD

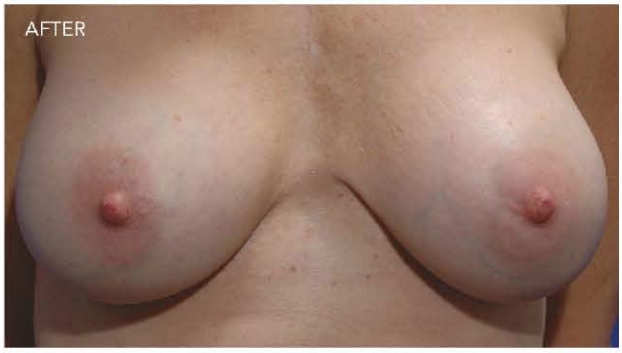
in for second-stage surgery, I do the nipple reconstruction, then use the fat grafting to give them more volume. This also helps with the shape of the breast. If there's a depression or asymmetry, I can correct that with the fat grafting."

Fat + Implant

Refined techniques in fat transfer can help to improve outcomes even in implant patients, where fat is used to cover imperfections and create a more natural appearance. "A lot of people have bony sternums so the most common place that I combine implants with fat is right where that breast bone is so you can't see the implant," says Dr. Coleman.

"There's another group of patients who want size [and cleavage], but they have a big gap between the chest wall and the breast tissue. Patients who have very thin breast tissue may also need soft tissue coverage over the implant, [so] I do the implant and the fat grafting at the same time," says Dr. Khoobehi.





This patient received silicone implants with fat grafting to correct failed saline implants.

> "If someone has a really strong history of breast cancer, I wouldn't necessarily exclude her, but there would be a lot of discussion."

Both Dr. Khoobehi and Dr. Coleman use fat to reduce the appearance of rippling sometimes seen in thin patients with saline implants. But Dr. Sanders has not been impressed with the results. "You can try to cover up rippling, though my impression is that it doesn't work that well for rippling," he says. "Someone who has had more of a reconstructive-type surgery may have an area where there is a bit of a divot. Filling that in with fat works out very, very well."

When working near implants, the greatest concern is rupture. "It is one of the things that you need to spend extra time discussing with the patient, including what to do if the implant ruptures," says Dr. Coleman.

Risk Factors

Because fat grafting to the breast requires no incisions, "the main complications relate to the liposuction used to harvest fat," says Dr. Khouri. "The other potential complication is areolar cysts." The main concerns—in terms of long-term safety—relate to patients with a history of breast cancer and what effect the procedure will have on breast cancer detection. "A lot of plastic surgeons are still a little hesitant about putting large amounts of fat into the breast when you know that some of that fat is going to produce calcifications and there is the potential for some interference with the mammogram," says Dr. Sanders. "They say that if the mammographer knows what he is doing he can distinguish the calcifications from breast cancer. But most of our patients are not able to go to a particular mammographer. They go [where the insurance company] sends them."

"The interesting thing is, when you take the implant out and do fat grafting, the followup mammogram is much, much better quality because now you can see all the breast tissue," says Dr. Khoobehi. "In some patients who have very dense breast tissue, the fat kind of goes in between the tissue and makes the mammogram easier to read."

Dr. Coleman has strong reservations about performing the procedure on women with a family

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history of certain types of breast cancer. "If someone has a really strong history of breast cancer, I wouldn't necessarily exclude her, but there would be a lot of discussion about it," he says. "If she has genetic markers or her mother died young or one of her aunts died young of breast cancer, I would discuss it with her a lot and it would entail additional informed consent and additional discussion."

Dr. Khoobehi—whose patients are being tracked through the University of Louisiana in an effort to gain more data on the long-term effects and overall safety of fat transfer to the breast—reminds practitioners that patients must undergo a mammogram before undergoing fat transfer to the breast. "It's very important to make sure that the patient is free of cancers," he says. "You cannot do anything to the breast without getting a good mammographic study and if there's a concern, get an MRI or other followup."

> "If you don't have blood supply within a short period of time, the fat will die."

Optimizing Outcomes

As with other fat transfer procedures, technique plays a crucial role in the outcome. The fat must be harvested gently so as not to traumatize the tissue. "I do it under low pressure suction," says Dr. Khoobehi. Surgeons must also use care when injecting to avoid placing large lumps of fat that are less likely to survive. "You put the cannula in and then while you withdraw the cannula, you lay the fat in small amounts—for each pass, you put one to two millimeters of fat down—and use multiple passes," says Dr. Khoobehi.

Dr. Coleman is a pioneer of the microdroplet or aliquot method. "You're not injecting, but sort of marbleizing or infiltrating [the breast] with multiple small injections," he says. "That allows the fat to remain closer to a blood supply and it puts the fat in in a way that's more stable. If you don't have blood supply within a short period of time, the fat will die and it can become scar tissue, so it really is important that you're really good at injection technique. No matter how carefully you take the fat out, no matter how carefully you prepare the area with the BRAVA, if you don't refine the fat so that it's relatively pure fat and then inject it in really tiny aliquots with each pass then you can end up with a bunch of dead tissue."

The interest in fat transfer for breast augmentation has led to a growth in educational opportunities at plastic surgery conferences and in the form of new forums dedicated to fat transfer technique.

While Dr. Sanders does not believe that fat transfer will usurp the popularity or patient satisfaction with implant surgeries, he does feel that plastic surgeons should be versed in its usage. "It's an exciting option," he says. "I really don't see it as something where you're going to do either all breast augmentations with implants or all with fat injection. I think the two procedures can work together. We're really at the threshold of this experience." ❖

Inga Hansen is the executive editor of *MedEsthetics*.

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